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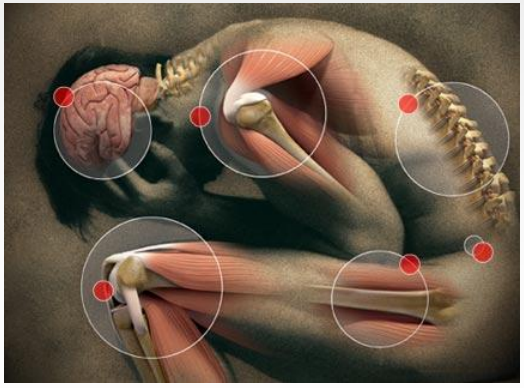
Research Interests

- Health Psychology
  - Addictive behaviors and chronic health conditions
- Programmatic line of research:
  - Reciprocal interactions between acute/chronic pain and tobacco smoking



Pain and Smoking

- Tobacco smoking (CDC, 2010)
  - 21% of U.S. adults (46 M)
  - 443,000 U.S. deaths annually
  - $193 B annual health care costs/lost productivity


Vincent van Gogh, 1885

- Chronic (non-cancer) pain (IASP, 2008; IOM, 2011)
  - Critical national health problem
  - 25-43% of U.S. adults (up to 116 M)
  - $125-635 B annual health care costs/lost productivity

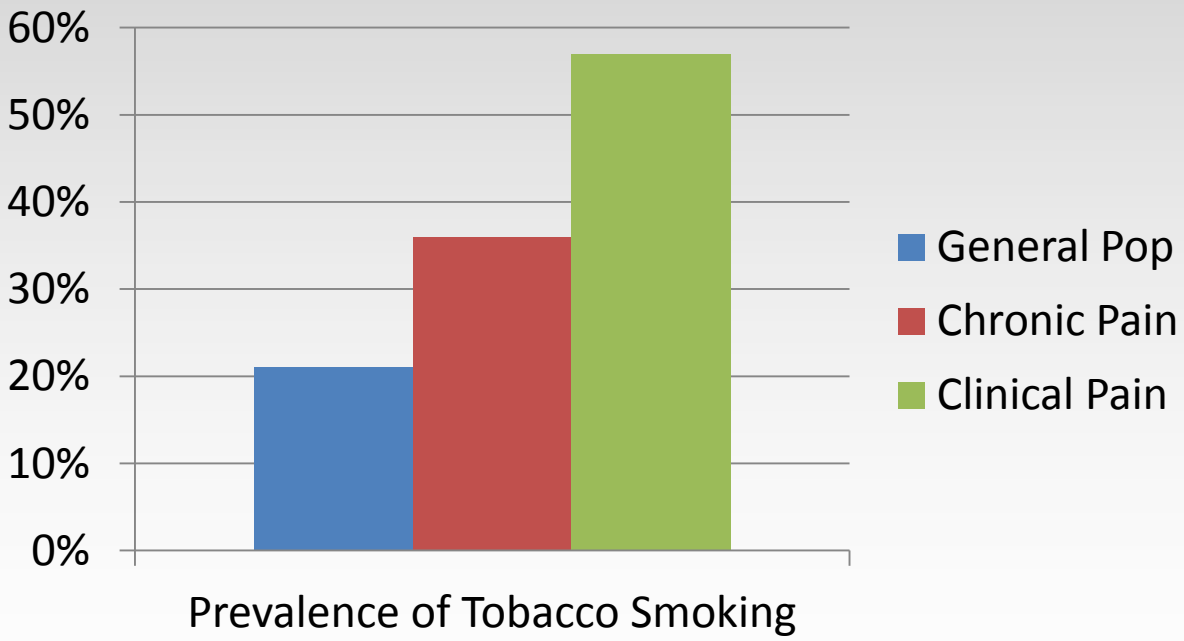

Sir Charles Bell, 1865

Smoking Among Persons w/ Pain

- Epidemiological data (e.g., Zvolensky et al., 2009)
  - 30-42% of persons who endorse past year chronic pain
    - After adjusting for sociodemographic, medical, and psychiatric features
- Clinical data (e.g., Hooten et al., 2011)
  - 49-68% of treatment-seeking pain patients
    - Greater with more severe pain/functional impairment
      - Smokers: greater pain/emotional distress and decreased activity

Pain and Smoking

- Both pain and smoking are highly prevalent, comorbid disorders

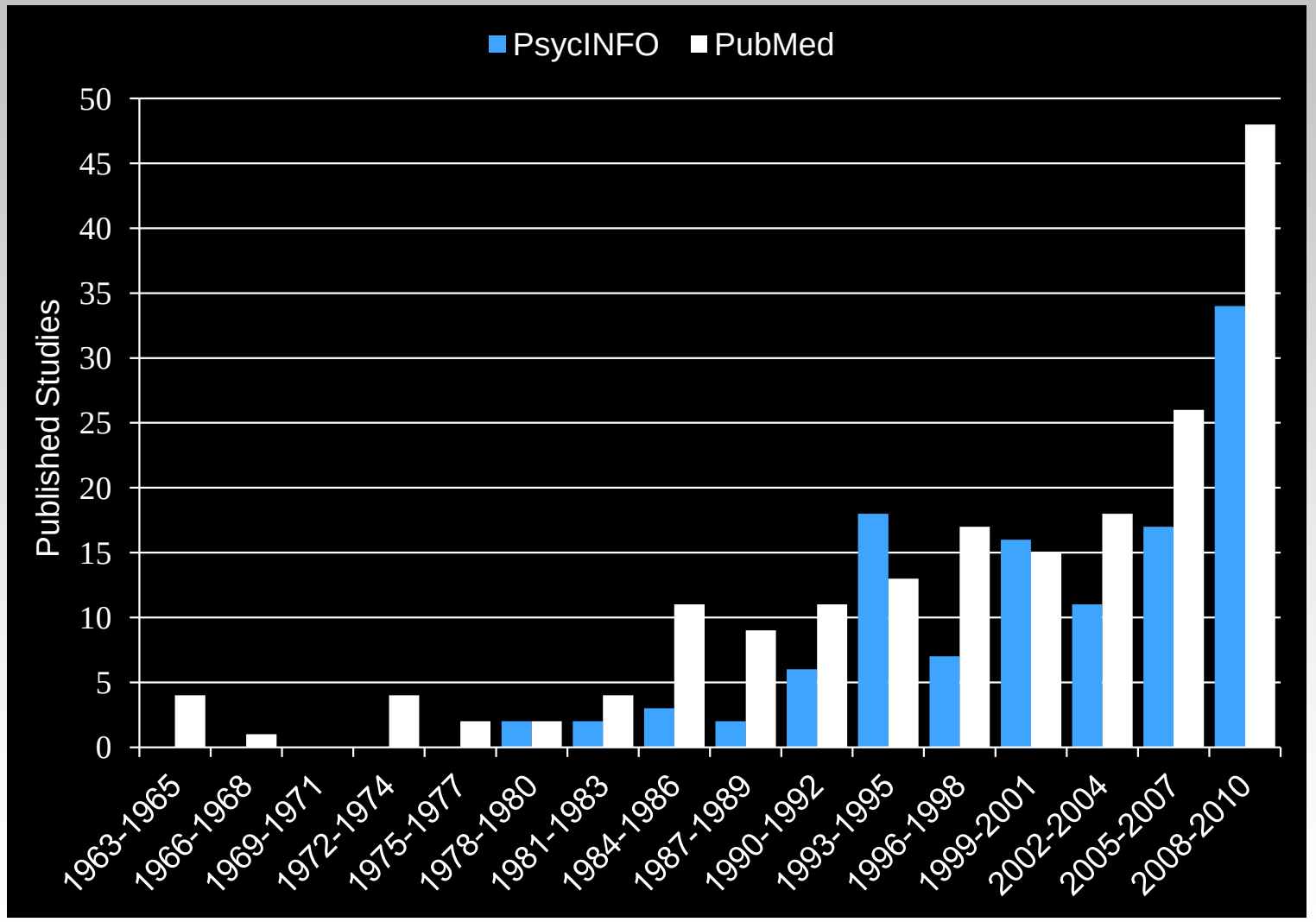


(Ditre et al., 2011; *Psychological Bulletin*)

Pain and Tobacco Smoking

- Highly prevalent comorbid conditions that:
  - Generate substantial challenges across multiple domains/disciplines (e.g., psychology, medicine, public health)
  - Engender significant burdens upon patients/systems
  - Attracted the attention of researchers and clinicians within the medical and behavioral sciences

Research on Pain and Smoking



(Ditre et al., 2011; *Psychological Bulletin*)

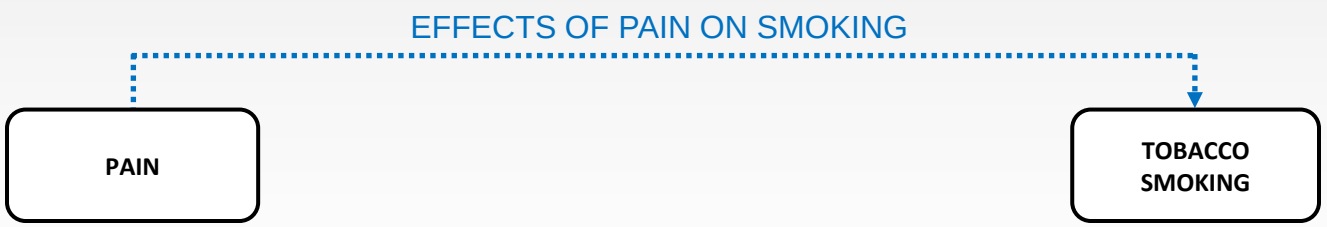
Two Directions of Inquiry

- Effects of Smoking on Pain
  - Tobacco smoking identified as a causal factor in the onset and progression of chronic pain
  - Smokers report more severe pain and require more analgesic medication than do nonsmokers
  - Nicotine has short acting pain-inhibitory effects

(Ditre et al., 2011; *Psychological Bulletin* - Ditre et al., 2011; *Pain* - Ditre et al., *under review*)

Two Directions of Inquiry

- Effects of Pain on Smoking
  - Pain increases desire and motivation to smoke
  - Pain patients report smoking to cope with pain
  - Pain associated with greater difficulty quitting
  - Pain may precipitate relapse to smoking



(Ditre et al., 2008; *Journal of Abnormal Psychology* - Ditre et al., 2010; *Journal of Abnormal Psychology* - Ditre et al., *under review*)

Effects of Pain on Smoking

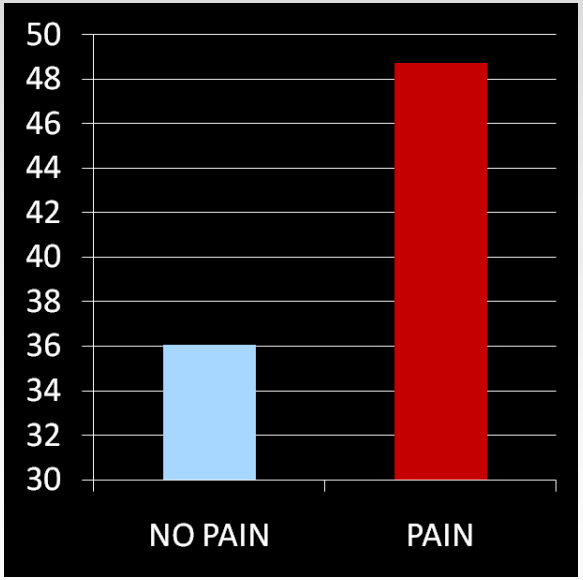
- Effects of Pain Induction on Smoking

(Ditre & Brandon, 2008; *Journal of Abnormal Psychology*)

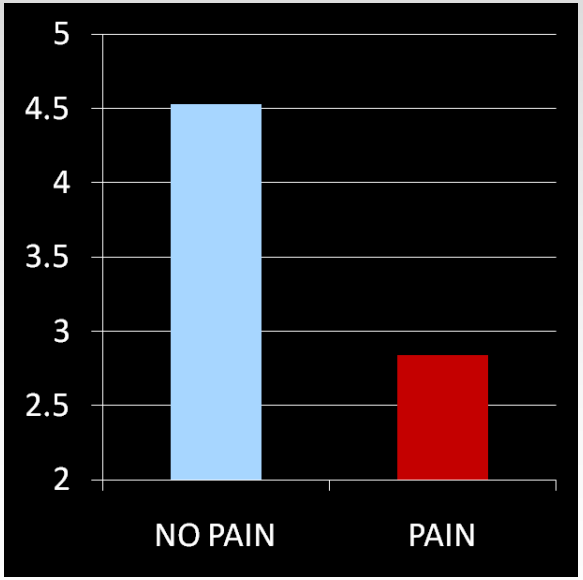
Effects of Pain on Smoking

- Effects of Pain Induction on Smoking
  - Pain increases desire and motivation to smoke

Urge to Smoke (0 – 60)
$F(4, 124) = 18.75$, $p < .001$, $f = .39$



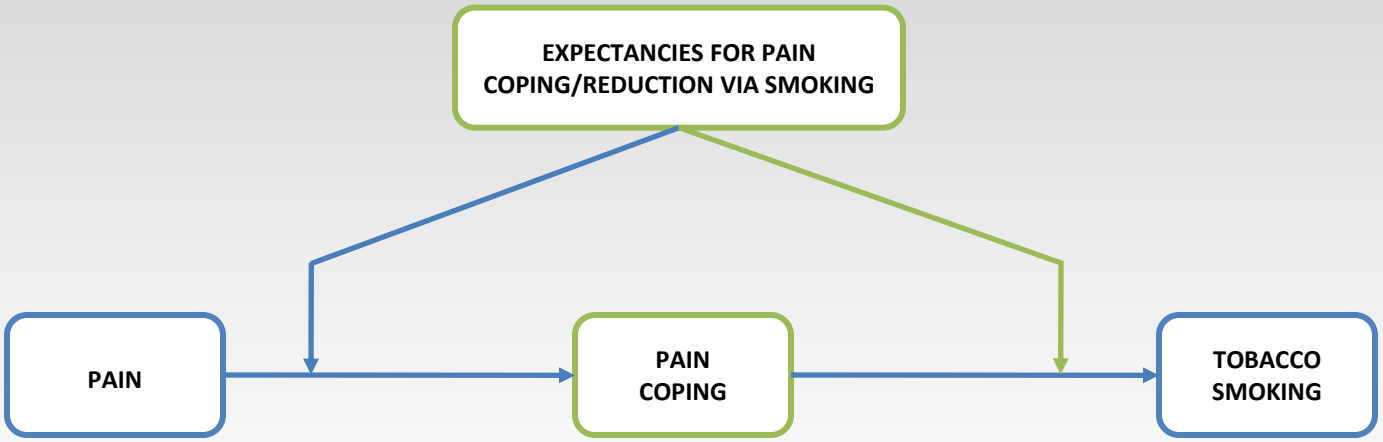
Latency to Smoke (in seconds)
F(4, 115) = 4.60, p = .03, f = .20



(Ditre & Brandon, 2008; *Journal of Abnormal Psychology*)

Effects of Pain on Smoking

- Effects of Expectancies and Coping on Pain-Induced Motivation to Smoke



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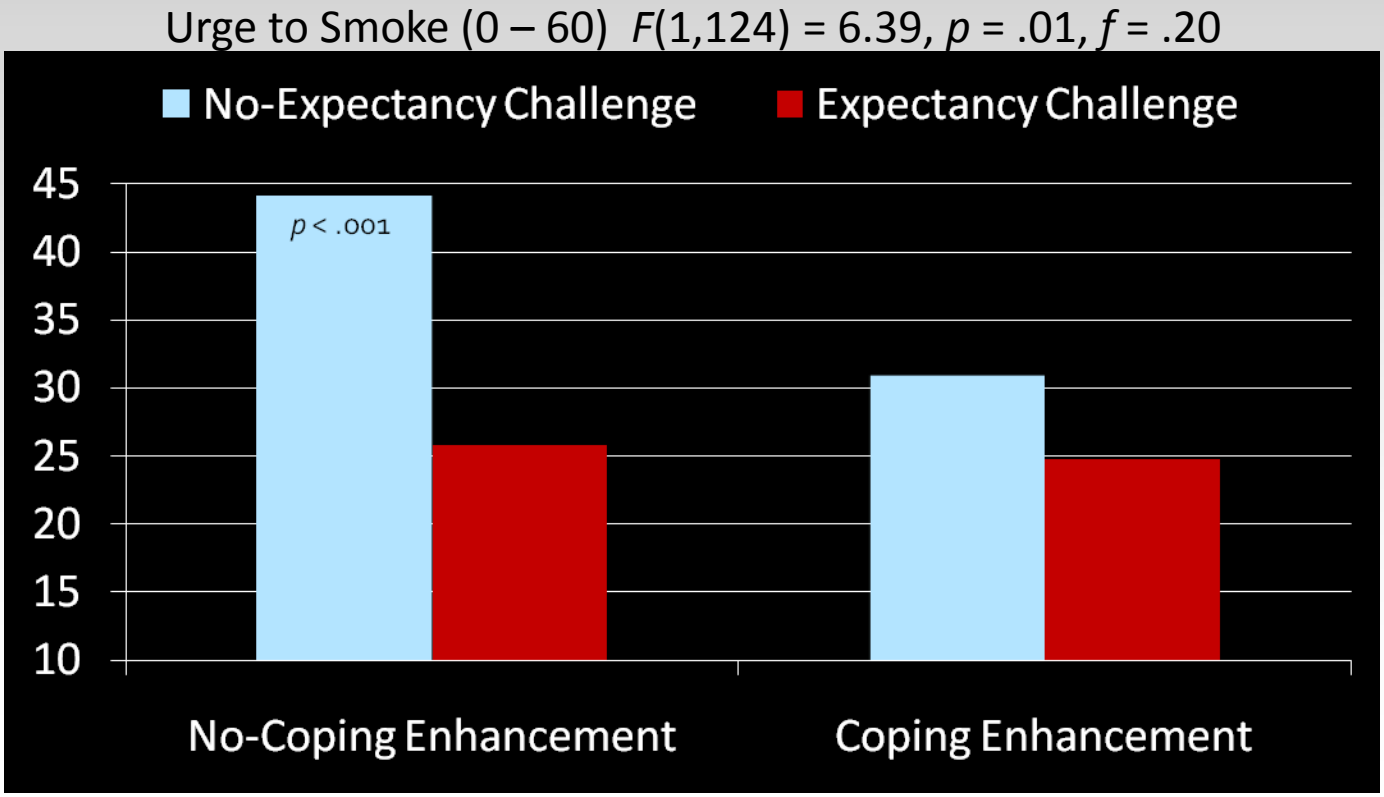

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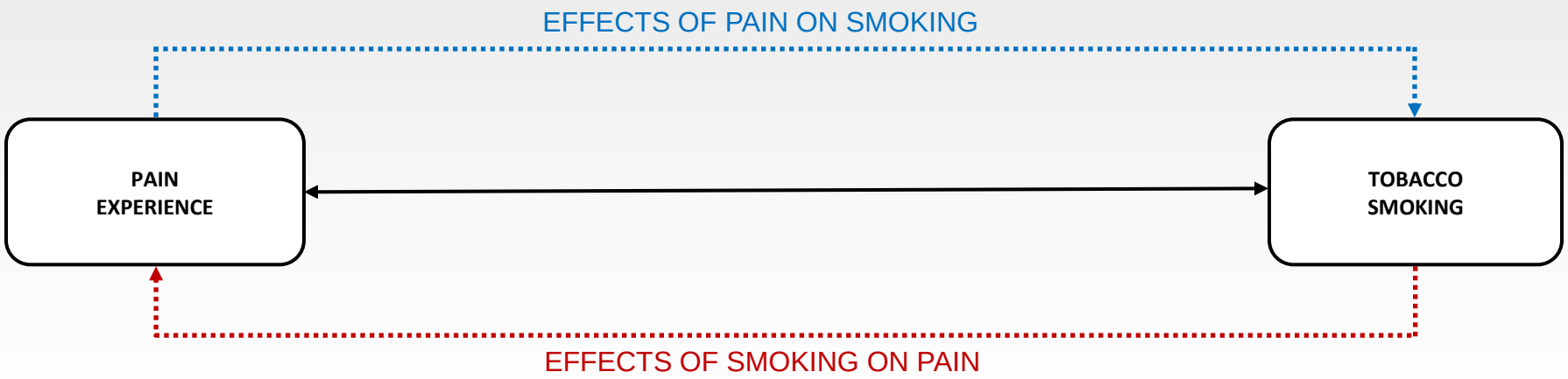
Pain as a Motivator of Smoking

- Pain may serve as a powerful reinforcer in the maintenance of tobacco smoking and nicotine dependence

- In the absence of more adaptive coping responses, persons with chronic pain may learn to rely on smoking to manage noxious internal states

Integrative Reciprocal Model

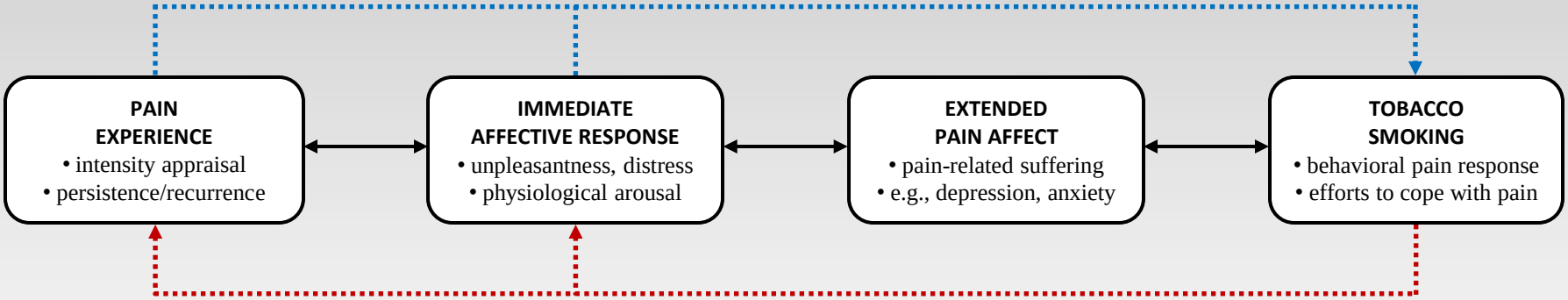
- Research findings integrated to present a reciprocal model of pain and smoking
  - Hypothesized to interact in the manner of a positive feedback loop, resulting in **greater pain**, **increased smoking**, and the **maintenance of both chronic pain and tobacco addiction**



(Ditre et al., 2011; *Psychological Bulletin*)

Integrative Reciprocal Model

- Four-stage model of pain processing (Riley & Price, 2004)



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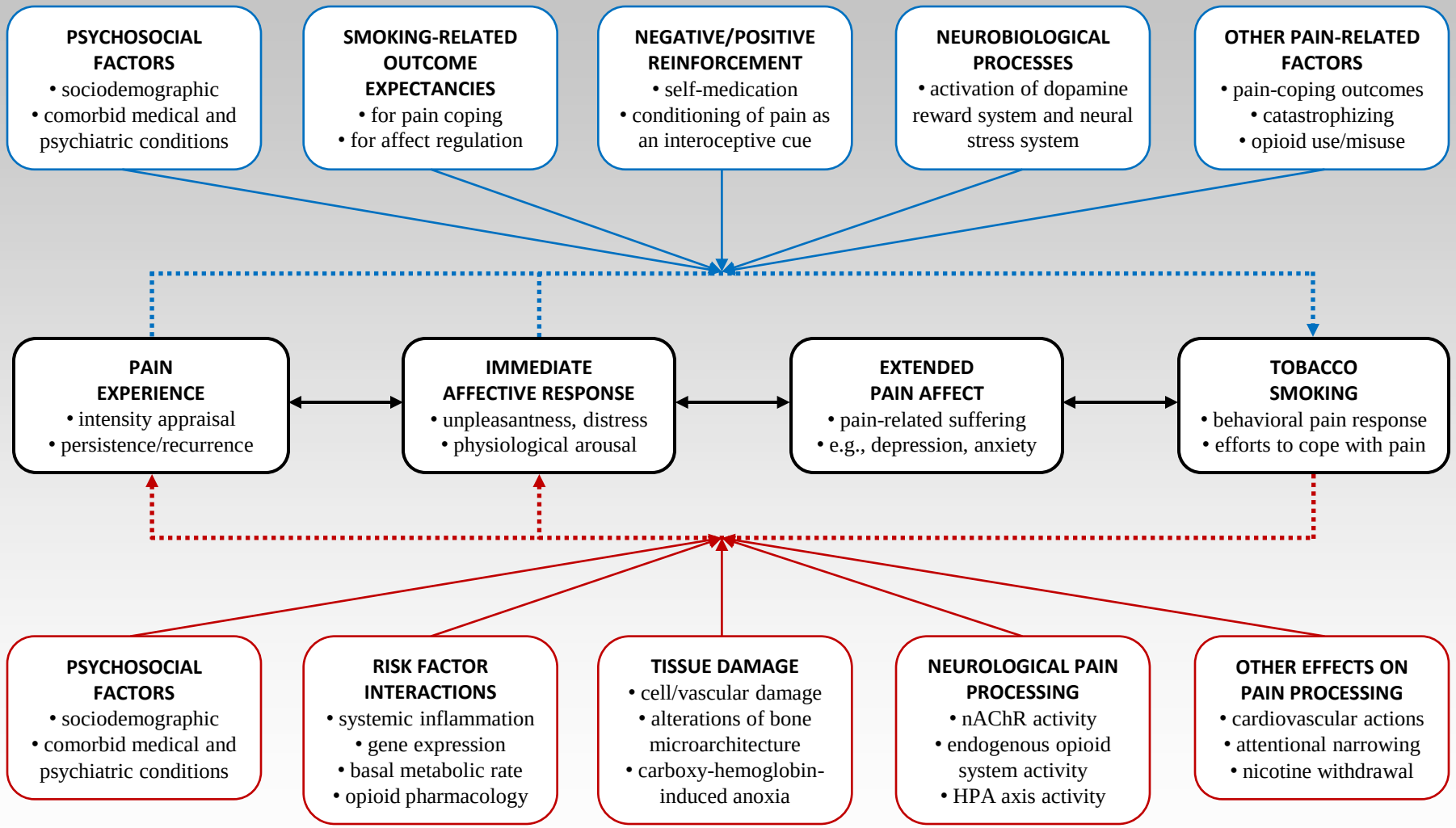
Integrative Reciprocal Model



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Current and Future Research

- Epidemiological analyses of pain and smoking
  - (e.g., targeted surveys, measure development)
- Laboratory-based research studies
  - (e.g., abstinence-induced hyperalgesia - R21)
- Naturalistic assessment of pain and smoking
  - (e.g., ecological momentary assessment)
- Develop and refine tailored interventions
  - (e.g., randomized clinical trials)

NIH/NIDA R21

- *Effects of Smoking Abstinence on Pain Reactivity: A Human Experimental Model*
  - There is reason to believe that abstaining from smoking may increase pain reactivity during the early stages of a quit attempt
    - Possibly as a function of nicotine withdrawal severity

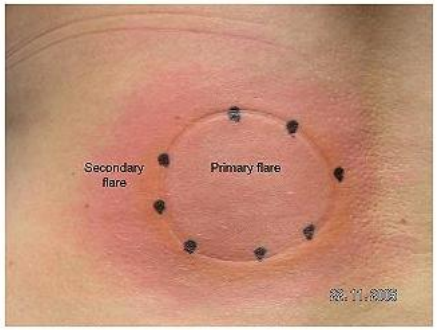
= ↑PAIN

NIH/NIDA R21

- Method
  - *N* = 198 smokers (> 15 cpd)
  - Baseline session
    - Randomized to 1 of 3 experimental conditions
      - Abstain from smoking for 24 hours
      - Abstain from smoking for 2 hours
      - Continue to smoke as usual
  - Experimental pain induction session
    - Apply topical capsaicin solution
      - DV: Self-reported and physiological pain reactivity

NIH/NIDA R21

- Capsaicin pain model
  - Derived from chili peppers (vanilloid receptor agonist)
  - Long lasting pain stimulus that approximates key features of neuropathic and inflammatory clinical pain
  - Permits tests of spontaneous pain, primary and secondary hyperalgesia, and areas of flare
    - May provide insight into neural mechanisms of action



CIH – Pain/Smoking Studies

- Development of CME/CEU educational program on pain and smoking for VA Healthcare Professionals

- Development of integrated brief pain/smoking intervention to increase motivation to quit among persons in pain
  - Study1: Sample = pain; IV = pain/smoking info (yes/no); DV = motivation, referral follow-up, outcomes
  - Study2: Obtaining feedback from behavioral health providers on integrated brief pain/smoking intervention

CIH – Pain/Smoking Studies

- Primary care providers' and patients' perceptions/knowledge of potential relations between pain and smoking
    - Identify barriers to implementation of integrated brief pain/smoking intervention
    - Overcome barriers to implementation
    - Provide integrated brief pain/smoking intervention
    - Provide standardized note to document implementation
    - Measure patient outcomes (patient perceptions of information; smoking-related; satisfaction with provider)

CIH – Other Studies

- Smoking
  - Daily fluctuations of [PTSD] and smoking (behavior, motivation/readiness to quit)
  - Relations among interpersonal stress, affect regulation, and smoking relapse
- Pain/Alcohol
  - Daily fluctuations of pain (severity/interference), mood, and alcohol use

CIH – Chronic Pain

- Pain is one of the most common complaints made by patients to primary care providers in the VA healthcare system (>50%)

- In a study of 1,800 OEF/OIF Veterans, 46.5% reported some pain, with 59% of those exceeding the VA clinical threshold of ≥ 4/10 (Gironda et al., 2006)

CIH – Chronic Pain

- Cognitive-behavioral approach to chronic pain
  - Clinical effectiveness has been demonstrated in several hundred studies with a wide range of pain syndromes
  - The integration of psychological interventions with conventional medical methods in the treatment of chronic pain is essential
  - Many pain patients have difficulty accepting that the primary treatment goal is improved functionality rather than pain relief

CIH – Chronic Pain

- Six phases of cognitive-behavioral treatment
  1. Assessment (ongoing)
  2. Reconceptualization
     - » View symptoms as circumscribed and addressable rather than vague and overwhelming
     - » Preparation for future intervention (minimize resistance and non-adherence)
  3. Skills acquisition and consolidation
     - » Coping skills training, change maladaptive interpretations
  4. Rehearsal and application
  5. Maintenance and generalization
  6. Follow-up

CIH – Chronic Pain

- Integrated Treatment for Chronic Pain and comorbid/co-occuring disorders
  - 30-54% of pain patients have comorbid depression (Banks & Kerns, 1996)
  - 24-67% of patients with substance use disorders have chronic pain (Otis & Pincus, 2008)
  - Integrated Treatment for Chronic Pain and PTSD
    - » John D. Otis, Terence M. Keane, Robert D. Kerns, Department of Veterans Affairs (VA) Boston Healthcare System, Boston, MA; VA Connecticut Healthcare System

Thank you